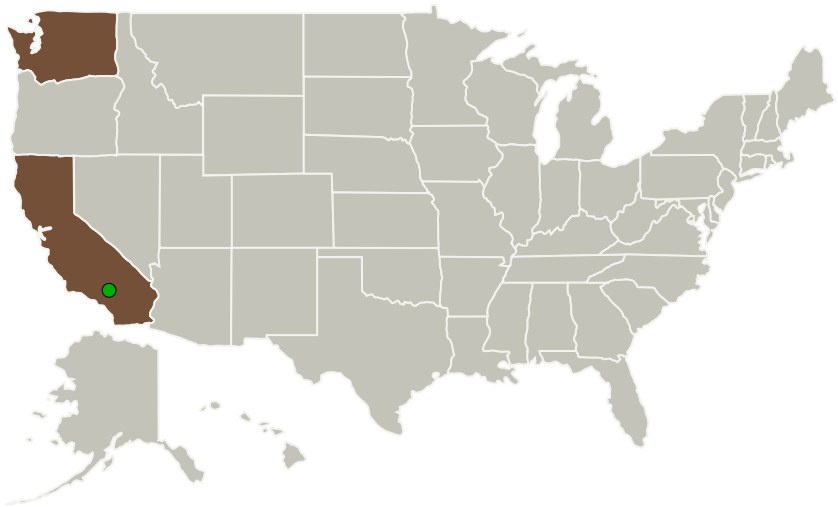
Aeroelastic/Aeroservoelastic Uncertainty and Reliability of Advanced Aerospace Vehicles in Flight and Ground Operations, Phase II

Completed Technology Project (2011 - 2013)

Project Introduction

ASSURE - Aeroelastic / Aeroservoelastic (AE/ASE) Uncertainty and Reliability Engineering capability - is a set of probabilistic computer programs for isolating uncertainties in simulation, manufacturing, test, measurement, and test to analysis correlation affecting the AE/ASE characteristics of advanced flight vehicles in flight and on the ground, and for studying the effects of such uncertainties. ASSURE will provide a quantitative assessment of the statistics of AE/ASE stability and dynamic response of aircraft at given flight conditions, throughout the flight envelope, on the runway, and throughout the aircraft fleet and its missions. It is designed to have significant flexibility in the types of problems analyzed, the solution methods used, and how problems are defined. ASSURE will be unique in the scope of problems tackled, systems complexity involved, and the inclusion of all elements affecting the ASE behavior of flight vehicles; including detailed models of structures, aerodynamics, sensors, actuators, control systems, landing gear, and flight operations and maintenance procedures. Uncertainties of the undamaged and damaged / repaired systems (structural, actuator, sensor, control computer, and landing gear, including possible aerodynamic consequences of damage) will be covered, with applications to test planning and analysis, design, certification, and fleet operation and maintenance.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Stirling Dynamics, Inc.	Lead Organization	Industry	Kirkland, Washington
Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California
SDI Engineering Inc.	Supporting Organization	Industry	Kirkland, Washington
University of Washington-Seattle Campus(UW)	Supporting Organization	Academia	Seattle, Washington

Primary U.S. Work Locations	
California	Washington

Project Transitions

July 2011: Project Start

September 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138688)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Stirling Dynamics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

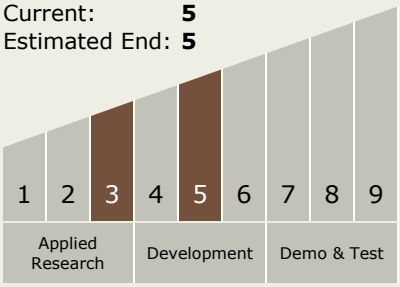
Carlos Torrez

Principal Investigator:

Marat Mor

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.3 Aeroelasticity

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System